AMRAD NEWSLETTER

Amateur Radio Research and Development Corporation March 1981

OUR MARCH 2 MEETING will be a computer music concert by Ken Coghill, WB4ZOH. Ken has been in his hermitage all winter coding up more classics. So bring your family and plan to get there early. As usual, the meeting will be at 7:30 p.m. at the Patrick Henry Branch Library, 101 Maple Ave E, Vienna, VA.

THERE WILL BE NO REGULAR APRIL MEETING in Vienna. Instead, please come to the 1981 ARRL Technical Symposium, run by AMRAD, on April 6 at 7:30 p.m. at the Capital Hilton Hotel, 16th & K Streets, NW, Washington, DC. Admission is $3 for this one event only or free if you register for the IEEE Vehicular Technology Society Annual Conference, April 6-8 at the same location. Symposium papers will include subjects of spread spectrum, packet radio, high-efficiency linear power amplification, high dynamic range mixers and another topic to be selected. For info on the IEEE VTS Conference contact: Gaspar Messina, 9800 Marquette, Bethesda, MD 20034, 202-632-6450 (FCC office).

FOR THOSE WHO MISSED BOB WATSON'S TALK at our February meeting, a booklet is available by mail from AMRAD. It is "FSK: Signals and Demodulation," Vol. 7 No. 5 Sep/Oct 1980, Watkins-Johnson Tech-notes. Or, you can request copies directly from the Editor, Tech-notes, Watkins-Johnson Company, 333 Hillview Ave, Palo Alto, CA 94303 on company letterhead.

THE NORTHERN VIRGINIA AMATEUR RADIO COUNCIL (NOVARC) ANNOUNCES LPM 81, the ARRL Roanoke Division's League Planning Meeting scheduled for May 9-10 at the Tyson's Corner Ramada Inn. (See ad.) It offers an excellent opportunity for individuals and clubs to play an active role in planning the future activities of the ARRL. LPM 81 is not a hamfest but a forum for exchange of ideas with your League officials. You don't have to be an official to attend. Everyone is welcome. AMRAD is organizing the technical program for this event. For details, write NOVARC, PO Box 682, McLean, VA 22101.

A TRIP TO ARRL HQ on February 12 by AMRAD president, Paul Rinaldo, W4RI moved AMRAD/ARRL liaison ahead in a number of areas. The main topic of conversation was AMNET, a concept for an amateur radio and computer communications network for North America. After many months of dialog, AMRAD prepared a draft proposal for an amateur data network consisting principally of seven HF nodes (packet radio stations) which are to tie in with local VHF circuitry and landline message systems. The proposal was well received at ARRL Hq with the recommendation that we add a portable HF node. The proposal is meant to be a tool for crystalizing concepts and finding sources of funding. AMNET is meant to be a cooperative venture with various amateur groups playing different roles according to their capabilities and interests. We see the ARRL as the network *manager*, AMRAD as network *developer*, the Vancouver Amateur Digital Communications Group (VADCG) as the leading *system designer*, and other substantial roles for other groups such as those in San Francisco, Hamilton, etc. Anyway, a start has been made, and we welcome cooperation with groups and individuals who wish to weigh in on this subject.

An HF Packet Radio Link is to be set up between W1AW and WD4IWG (that's AMRAD's club call sign) in the near future. Both ends will be using the Vancouver packet node controller boards. The link will be experimental, and tests with other groups are welcome.

An AMRAD Working Paper examining possible message formats for message switching via AMNET was delivered to the Communications Department of ARRL Hq. Message switching is only one mode of AMNET. There will be others such as *virtual connection (QSO)* and *file transfer*.

The ARRL Technical Dept. is in need of two RF/digital editors with BSEE's. The ARRL will pay travel and accommodation expenses for interviews as well as relocation expenses upon employment. Write Doug DeMaw, W1FB, ARRL, 225 Main St, Newington, CT 06111 or phone 203-666-1541.

THE DEAF AND THE TTY

Barry Strassler
Executive Director
Telecommunications for the Deaf, Inc.
814 Thayer Avenue
Silver Spring, Maryland 20910
TTY 301-589-3006

California Landmark Decision

I was going to write on a different topic for this month's column. But last-minute developments have a way of taking a higher news priority. Thus, the latest development is no exception.

Some of you are aware of the California bill 597 which provides TDD's free to Californians certified as deaf or severely hearing impaired. This bill seemed simple enough as drafted, but it involved extensive State Public Utility Commission hearings. Much disagreement ensued among telecommunications people on the implications of this bill. TDI, for one, sent Joe Slotnick, its vice president, to appear at a testimony.

The gist is -- Just what kind of TDD's would qualify as a *minimum acceptable* device to meet the needs of this bill? Today's existing TDD's are based on the Baudot modem which, according to many telecommunications authorities, is obsolete. Manufacturers know it, but re-tooling their facilities to come out with a Bell 103 ASCII modem could result in new TDD's which are incompatible with existing TDD's.

It has been the position of the TDI computer communications committee to endorse a dual-modem TDD, thus having the best of both worlds.

If the PUC endorsed existing modems, the danger would be locking the deaf into obsolete models while better and incompatible devices would come into the picture in the future.

It appeared that the PUC was leaning towards the existing type of TDD, a decision that could forestall the progress of telecommunications technology. One PUC staff official went on record as saying that today's TDD is the machine of the deaf for the next 100 years and that ASCII is too complicated for the average deaf person.

Fortunately on January 21st, the California PUC adopted a landmark decision overruling the PUC staff recommendation of the Baudot-only modem and requiring dual Baudot/ASCII (Weitbrecht/Bell 103) devices in the State distribution program.

At this moment, only two manufactures have Bell 103 optional capabilities in their TDD's. Because California is considered the pacesetter for the rest of the nation, it would be conceivable for other manufac to follow suit. Stay tuned.

TELECOMMUNICATIONS FOR THE DEAF is holding their fourth international convention in Kansas City on June 23-27, 1981 at the Glenwood Manor Hotel, Overland Park, KS. The event is being hosted by the Missouri-Kansas Telecommunications for the Deaf, Inc. In addition to the usual agenda items, there will be a workshop on local answering services, captioned films, reception-skit evening, a picnic and exhibits. For more info write to: Mrs. Susie K. Ayers, Registration Chairperson, 1127 East Prairie, Olathe, KS 66061.

"TELETYPEWRITERS MADE EASY" is a loose-leaf book on installation and maintenance of teletypewriters commonly used by the deaf (and hams too). It includes detailed sections on Teletype Corp. models 15, 28 and 32. It is an excellent reference for radio amateurs who are involved in RTTY. It includes lots of pictures and diagrams. If interested please write Telecommunications for the Deaf, Inc., 814 Thayer Avenue, Silver Spring, MD 20910. The price is $14.95 per copy including postage and handling.

AMRAD TDD COMPUTER INTERFACES have been taken to the engineering model stage on the Apple, TRS-80 and PET home computers. We are now in the process of trying to locate manufacturers who can productize and produce them for general sale to the deaf. We are talking to several manufacturers and TDI. If you have ideas let us know.

PROTOCOL

David W. Borden, K8MMO
Rt 2, Box 233B
Sterling, VA 22170
703-450-5284 (Metro No.)

In between my exotic trips around the world, I have been busy on my (VADCG) Terminal Node Controller (TNC). I have expended about $130 on it, but I had a lot of parts laying around from other projects. I got the latest *Byte Magazine* and costed out the parts using my usual sources. The result was $215. Doug Lockhart, VE7APU sells a kit for around US$230, but he is not ripping us off at all. I am sure that he pays more for parts than we do. A good example is the 40-pin Intel chips.

The Intel chips required by the VADCG controller are hard to obtain locally. The 8273 HDLC/SDLC chip is a special-order item at the two local (Maryland) distributors. If you can get them to special order it, it is only approximately $41. If you call Jade in California, they stock it at $73. The 8250 programmable USART is not listed by the local distributors (a bad sign of discontination perhaps?). Jade and Jameco in California list it in the $15 range. I think that as soon as we get up and running in this area, some engineering type needs to design us a new TNC using less expensive and more available chips. The 8085 microprocessor is cheap enough at about $18 locally, but the 8080 is now only $2.50 at most places. Somone needs to research all of this and experiment a little. I have been convinced that the hardware controller is a good idea; I just want it to be less expensive and more easily reproduced. Hank Magnuski's letter, published last month, indicated that San Francisco Bay Area hams are working on an S-100 interface for the Western Digital chip. He also indicates that he is buying the 8273 for only $34.

I gave away a Bell 202 modem to another ham at work to try to get him up on the repeater in data. I guess sooner or later we need to get up a data repeater (no voice allowed). Hopefully we will soon have this problem as all the local data gang gets up with Bell 202's. We need to leave 147.81/21 as a service channel and general voice repeater, just like it has been in the past. We also need to get our HF act together soon. How shall we transmit on HF? Maybe we can just modify our ST-6 stuff to handle the increased baud rates. Please send in some suggestions. While everyone is thinking about it, I am changing my 14075 kHz crystal in my monitoring receiver to 14076. Doug Lockhart says that he will turn on the packet beacon for us whenever we are ready.

I thought that this month we should go over the software that will run in the TNC and what it is doing. I suspect that we will be changing this software almost as soon as we get it running, but first we must understand the *stock* versions.

The TNC is really a computer with a serial device (8250) and an HDLC protocol controller (8273) that handles a line (in our case a modem and radio link) and a terminal (ASCII terminal or what have you). It does all this by a program running in memory. We could use all RAM (read and write memory) if we had a way of loading the thing up initially (cassette recorder, etc.). However, the device was designed with 4K of ROM (read only memory) and 4K of RAM. The ROM contains the program, which we can change by burning new ROM's, and the RAM is used for two circular buffers which contain the data that we want to send and the data we get.

The program that contains the communications protocol and communicates with the line is called the Line Interface Program (LIP). It drives the 8273 HDLC chip, switches between transmit and receive, puts blocks of data into a line buffer and advises the terminal program that it's done. It accepts data from the terminal buffer and transmits it out the line when told to. It handles link control (error recovery, timeouts, retransmissions and supervisory frames). It resides in the first two PROM's in memory from 0000H to 07FFH (with room to spare actually). All terminal nodes (the end users of our as-yet-to-be-formed network) have the same LIP since they all use the same protocol. This system was designed to have a station node controlling everything, but we will not begin that way. Initially, we will talk to each other, and all of us will have a TNC only. A program is provided for this purpose, called LIPTT, since we want terminal to terminal communications.

The program that contains the device

drivers for whatever we want to interface to the network (teletypewriter, ASCII terminal, microcomputer, printer, etc.) is called the Terminal Interface Program (TIP). It accepts data from the terminal and puts it in blocks into the terminal buffer, advising the LIP that it is ready. It takes blocks from the line buffer and sends to the terminal when the LIP advises that they are ready. This is the *personality* part of the system. If you have a Baudot 60-wpm teleprinter (possibly a deaf user), this is where it gets hooked up in software. The TIP would translate the Baudot code to ASCII code, and the other users in the system would never know. Again, because we will not use a station node, our version of this program is called the TIPTT (for terminal to terminal).

Both the TIP and LIP programs use interrupts to speak to each other. This makes for easy (for Doug Lockhart) programming and no lost data which would result if polling were used.

What happens when you turn on your TNC, connect up the terminal and the modem-radio combination to 147.81/.21? Initially, the programs are in *monitor* mode. Any correctly received frames from anybody will be put up on your terminal/printer without error checking or recovery. Now let's say that I want to talk to Paul, W4RI who has a TNC setup like mine. I type his call sign and follow it by a control-X, and the program will then try to establish comms with him. It will keep trying for some time and if successful it will return to the monitor mode (Paul left his gear powered down). If it hooks up with Paul, it will print:

W4RI CCCCCC

This indicates a successful connection. I can then talk to Paul (only now), and error recovery is in effect. Bad packets are retried until acknowledged. When I am ready to sign off, I type control-Y, and the program will print:

W4RI CCCCCC

This indicates a disconnect and return to monitor mode where I can watch all the other packet activity on the channel.

I have been reading a good deal of data from the IEEE on packet networks and will outline use of repeaters (or whatever we end up calling them) and how to talk to Hank in California with packet radio next month. There is a good deal of discussion that will be required on which system to adopt because there are so many. In the meantime, get a Bell 202 modem and join Terry, WB4JFI and myself on 147.81/121 300/1200-baud ASCII. I finally got my Morse ID right and am ready to communicate, although no packets yet. Hank has some modems for sale (see February issue) if you cannot find a surplus bargain at a hamfest.

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CORRESPONDENCE:

P.O. Box 248
Norwell, Mass 02061
January 13th

Dear Sirs:

I noted an article on your activities in Handi-Ham World. Your name, AMRAD, rang a bell with me. I find myself wondering if you might not be aware of Amrad of Medford Hillside fame in Massachusetts way back in the early days of radio. In fact there used to be arguments as to first broadcasting station. Whether it be WGI Amrad or Schenectady. I also own a couple of modular Amrad unit for receiving. Once I had a whole set up. Incidentally I still have the first loud speaker that was used with the old Amrad. It happens to be a Cory phone.

Just thought you might be interested in the original AMRAD outfit. Also of interest to me at least, an old Boss of mine and a well known scientist, Dr. C G Smith, used to be a wheel in said company. I just cannot remember when it ceased to exist.

Sincerely,
Dalton Harrow W1EPW

AMRAD - a recycled name?
That's ok, my call is
twice recycled - W4RI, Ed.

PETIT LOGIC SYSTEMS is closing its business to retailing on March 1. Present stock will be sold on a first-come-first-served basis. Write P.O. Box 51, Oak Harbor, WA 98277 or call 206-675-1383. Ray Petit, W7GHM also advises that an article on coherent CW (CCW) is due in *QST* about midyear. If you are interested in reprints of the Coherent CW Newsletter, write Charles Woodson, W6NEY, 4523 Tolman Hall, University of California, Berkeley, CA 94720.

THE TRENTON COMPUTER FESTIVAL is on again for April 25-26, 1981. (The Dayton Hamvention is April 24-26.) This 6th TCF will be bigger and better than the previous five. It will have a huge 5-acre outdoor flea market and up to 90 booths. TCF-81 will be held at Trenton State College, just outside of Trenton, NJ. Admission for the two days is $5 ($2 for students). The Saturday night banquet is $10. Flea market spots are $5 per day. For more info contact Dr. Allen Katz, K2UYH, Trenton State College, Hillwood Lakes, P.O. Box 940, Trenton, NJ 08625, 609-771-2487.

DESIGNING MODERN POWER AMPLIFIERS is a short course being offered by McGraw-Hill in New York, March 19-20; San Francisco, April 16-17; Chicago, May 18-19; and, Boston, June 8-9. The seminar fee is $495. Contact Ms. Barbara Bancroft, McGraw-Hill Seminar Center, 305 Madison Av, Rm 3112, New York, NY 10017, 212-687-0243 or c/o Howard Flood Telex 12-7960.

TAB BOOKS, Blue Ridge Summit, PA 17214, 717-794-2191, announces a number of new books, including: The PLL Synthesized Cookbook (TAB 1243) by Harold Kinley $7.95 paperback, and The MC6809 Cookbook (TAB 1209) by Carl D Warren $6.95 paperback.

AMRAD CBBS Directory

This is a directory of Computerized Bulletin Board Systems as of February 1981. This CBBS directory is being published and distributed by the Amateur Radio Research and Development Corporation primarily as a service to AMRAD membership. Additional copies may be obtained at a cost of $1 for printing and mailing to AMRAD, 1524 Springvale Ave, McLean, VA 22101. Full permission for photocopying or reprinting this directory is granted provided that credit is given.

We have made a sincere effort to verify the information in this directory. There are some question marks by doubtful data, and there are numerous blanks, particularly for mailing addresses. We would appreciate your help in supplying missing data and corrections to: Terry Fox, WB4JFI, 1819 Anderson Rd, Falls Church, VA 22043, or via the AMRAD CBBS 703-734-1387.

This directory was compiled by Terry Fox with help from Dave Borden, Bob Kals, Paul Rinaldo and others.

Alabama

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Birmingham	205-945-1489	U	ABBS	The Computer Center	433 Valley Ave	35209	E&W		(V)205-942-8567
Birmingham	205-942-6621			Birmingham Micro.Comp.Grp			E&W	300	

Alaska

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Ketchikan	907-225-6789		ABBS						

Arizona

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Phoenix	602-957-4428	U	EBBS	Desert Technology	Po Box 15113	85060	*24		
Phoenix	602-866-0258	U	ABBS	The Computer Store	14216 N.28th Dr.	85029	E&W		
Phoenix	602-956-5612	U	CBBS	Chris			*24		(V) 602-957-4471
Phoenix	602-957-9282	U	ABBS	Computerland of Phoenix	3152 E.Camelback	85106	E&W		Store 955-1486

Southern California

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Los Angeles	213-276-4276	N	ABBS	27-Micro					
Los Angeles	213-291-9314		PMS						
Torrance	213-316-5706	N	ABBS						
Woodland Hill	213-346-1849		ABBS						
Canoga Park	213-340-0135		ABBS	Original AppleCorps			*24		
Torrance	213-349-3715	U	APPLE	Teleph. S'ware Conn.					
Granada Hills	213-349-5728		ABBS	Rainbow Computing	10723 White Oak Av.	91344			(V) 213-360-2171
Los Angeles	213-360-6332	B	ABBS	System pulled					
Los Angeles	213-367-0013		CBBS	Valley Comp.Club ?	PO Box 6545	91510			may be old/bad No.
Lawndale	213-370-3160		ABBS				E&W		
Van Nuys	213-371-1660		ABBS	Computer Components	5848 Sepulveda Bl.	91411			(V) 213-768-7411
Tarzana	213-383-9666		Novation	Modem Test Center	18664 Oxnard St.	91356			(V) 213-996-5060
Santa Monica	213-394-1505		ABBS	Computer Store			E&W		
Brentwood	213-395-1592		ABBS	Programma Int'l			*24		
Santa Monica	213-396-3905		ABBS						
Signal Hill	213-424-3506	B	ABBS	Peripherals Unltd	Moved to Vienna Va.				
Long Beach	213-428-4718		ABBS						
Pacific Pal.	213-459-3177	B	ABBS	system pulled					
Long Beach	213-459-6400	U	ABBS	Pacific Palisades					
Los Angeles	213-566-8035		Forum 80						
Los Angeles	213-631-3186		Forum 80						
Los Angeles	213-654-0759		ABBS						
Inglewood	213-673-2206	U	ABBS	Morris Micro Prod.			*24		
Hawthorne	213-675-8803		ABBS				*24		
El Segundo	213-679-0591		ABBS	Hughes Apple Users					
Burbank	213-709-5423	U	RCPM	Valley Computer Club	PO Box 6545	91510	E&W	110,300	Mike Karas
Van Nuys	213-787-4004	B		Not in Service					
Pasadena	213-795-3788		CBBS	Aardvark Comp.					
Pasadena	213-799-1632	U	CBBS	Dick Mead			*24	110-600+	
Pasadena	213-799-6514		ABBS						
Marina Del Ray	213-821-7369		ABBS				*24		
Los Angeles	213-826-0325		ABBS	Deltrex			*24		
Santa Monica	213-828-3400		ABBS	MC Computer Store			E&W		Rich Conners
San Fernando	213-843-5390		CBBS						
Woodland Hills	213-887-6521		CBBS	Litton Comp.Club	550 Canogo Ave.	91365			(V) 213-887-2321
Los Angeles	213-921-2111		ABBS	Computer Forum					

	714-287-9379						E&W		
Santee	714-449-5689	U	PMS#1	Bill Blue	Box 1318,Lakeside	94020	*24		(V) 714-449-4222
Lemon Grove	714-463-0461	B		system pulled					
Laguna Niguel	714-495-6458		ABBS						
Fullerton	714-526-3687		COMM-80	Orange Cty.TRS-80 Users Gp	2532 E.Commonwealth	92631	*24		(V) 714-738-0789
Orange Cnty	714-537-7913		Forum-80	Oran.Cty.Data Exch.			*24		Rod Manke
San Diego	714-565-0961	B		Wrong Number					
San Diego	714-571-5550	U	CBBS	San Diego Computer Society	Box 81537	92138	*24		
San Diego	714-582-9557		PMS	Computer Merchant	2527 University Av.	92104			(V) 714-293-7730
San Diego	714-697-2176	B		Old Number					
Orange Cnty	714-730-1206		Forum-80	John McGorety					
Santa Fe Spr.	714-739-0711		ABBS	Computer Forum					
Irvine	714-751-1422		ABBS	Computer World			*24		
Anaheim	714-772-8868		PMS	Imagination Factory			*24		
Westminster	714-898-1984		ABBS	Computer World					
Aneheim	714-952-2110		Forum-80	Self Help, Hypnosis					
Hunington Bch.	714-962-7979		ABBS	Korsmeyer Electronics			*24		
Hunington Bch.	714-963-7222		ABBS	Apple Tree					
Hunington Bch.	714-964-4346		ABBS	Korsmeyer (store #?)					
Camarillo	805-484-9904		Forum-80	Ventura County			*24		
Bakersfield	805-527-9321	U	RCPM	CP/M Net, Kelly Smith			*24	300	
Bakersfield	805-682-7876		NBBS	Bill McGrew			8A-11P		
Ventura Cnty	805-964-4115		NBBS	Carl Stuart					4th ring

Northern California

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Fresno	209-638-6392								may need password
San Jose	408-227-5416		ACBBS	Computer Emporium					
Santa Clara	408-241-1956	U	CBBS	John Wood					
Santa Clara	408-246-2805		CBBS						
San Jose	408-263-0248		BilBd-80				*24		
San Jose	408-263-9650			Mark Granau ($1.50/Mo)					
Santa Clara	408-296-5799		8BBS#1	Bernard Klatt			*24		PDP-8
San Francisco	415-348-2139		Forum-80	Steve Filice			*24		
	415-348-2396	B							
Palo Alto	415-493-7691		PMS	Robert Davies			*24		
Berkeley	415-527-0400	U	CBBS	Proxima (North Star Comp.)	1440 Fourth St.	94710	*24		(V) 415-527-6950
San Carlos	415-593-1200		ABBS						
San Francisco	415-647-9524		XBBS	Kinky Kumputer			*24		
San Francisco	415-661-0705		ABBS						
San Francisco	415-668-4246	B	ABBS						
Los Altos	415-697-5622			PC NET-nights ?					
Freemont	415-792-8406	U	ABBS	Zoram Asc. Gary Falsken					(V) 415-794-8287
	415-851-3453								
	415-858-2840	N							
Los Altos	415-948-1474		ABBS	PCNET, Dave Caulkins	437 Mundel	94022	E+W		(V) 408-948-5753
Mntn.View	415-968-5140		3KBBS	<cr>help CBBS.MCDCCS/TPBOSS					
Vacaville	707-448-9055		ABBS	Apple Orchard			E+W		
Sacramento	916-393-4457		N*BBS	Aviators Bltn Bd.					
Sacramento	916-483-8718			Sacramento Comp. Club					

Colorado

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Denver	303-759-2625	U	ABBS	Computerland of Denver	2422 S.Colorado Av	80222			
Denver	303-771-3826		Forum-80						
Denver	303-789-0936	U	Forum-80	Apparat Inc.	4401 S.Tarmac Pky	80237	*24		(V) 303-741-1778

Connecticut

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Stamford	203-348-6353	U	NBBS	Pers.Comp.Soc.of Stamford			*24		Bob Griffin
Stamford	203-357-1570	U	N*BBS	Conn.Byte-Swappers	Jerry Koret,WA1YJK				PW=MAILD
Stamford	203-357-1920		ABBS	MUNCH					
	203-367-4176	B	N*						

District of Columbia

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Washington	202-337-4694	U	PSBBS	The Program Store	PO Box 9609	20016	*24	110-600+	(V) 202-337-4691
Washington	202-635-5730	U	"help wacs"	Wash.Amateur Comp.Society	4201 Mass.Av.#168	20016	E&W	110,300	Chuck Patten

Florida

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Miami	305-261-3639		ABBS	Byte Shop	7825 Bird Rd.	33155	E&W		(V) 305-264-2983
Ft.Lauderdale	305-566-0805		ABBS	A.C.E.S.					
W.Palm Beach	305-689-3234		ABBS				*24		
Ft.Lauderdale	305-772-4444		Forum-80						
Miami	305-821-7401		ABBS	Miami Apple Users Group	2300N W.135th St.	33167	*24		(V) 305-681-4689
Orlando	305-862-6917		Forum-80						
Hollywood	305-989-9647		ABBS	GLTC.DIV1			*24		
Tampa	813-223-7683		Forum-80				*24		
Pinelles Pk	813-541-2580		Bullet-80						
Tampa	813-885-4811		"hello-Z999"	Computer Sales Sys.					
Ft.Walton Bch	904-243-1257		ABBS	Destin					
	904-243-8565								

Georgia

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Atlanta	404-325-0526	B							
Atlanta	404-394-4220		CBBS	Larry Hughes			*24		
Atlanta	404-428-0238		ABBS						
Atlanta	404-458-4886	B							
Augusta	404-733-3461	N	ABBS	AGS, Jack Jackson					
Augusta	404-790-8614		ABBS	Baileys Computer Store	2418 Black Orchard	30906			
Augusta	404-793-1045		ABBS	Augusta Apple Corps.					Harold Privette
Atlanta	404-939-1520		NBBS#1	Les Freed			*24		
Atlanta	404-939-8429		ABBS	Cyberian System			>11Pm		
Smirna	404-953-0723	U	ABBS	Computerland	243 Cobb Pky	30080	E&W		
Atlanta	404-252-2324	N	NBBS	Bob Strong			Wknds		
Atlanta	404-289-5538	U		Muchiri Motilewa					pswd= sysop name
Augusta	803-279-5392		Forum-80	Ed Meloan					

Illinois

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Decatur	217-429-5505		ABBS	MC^3			Eve.		
Galesburg	309-342-7178		BlBd	Knox Komputer Klub			Eve.		
Peoria	309-688-0970		ABBS	Brian Moran			E&W		
	or 688-0470								
Washington	309-694-6531		ABBS	Computer Core			*24		
Chicago	312-234-9257	U	RCPM	Calamity Cliffs Computer Ctr.			2P-2A	110-600+	Tom C.
Arlington Hgts	312-255-6489		ABBS	Computerland of Arl.Hgts	50E Rand Rd.	60004	E&W		(V) 312-255-6488
Cook Cnty	312-296-7486	B	Forum-80	Intercept Operator					
Chicago	312-296-8083	B	Forum-80	Mike Britton					

Chicago	312-337-6631	ABBS	Pers.Comp.of Chicago	100 E.Ohio St.	60611	3P-Mid		Bill Easterling (V) 312-337-6631
Chicago	312-359-9450	PBBS?	Bill Godfrey					
Naperville	312-420-7995	ABBS	Illinni Micro			E&W		
	312-520-7141 B		old cbbs#1					
Chicago	312-545-8086 U	CBBS#1	Ward & Randy(the 1st)	Box 52,S.Holland	60473	*24	110-600+	
Chicago	312-622-9609	ABBS	WIDL Video	5245 W.DIversey	60639	Eve.		(V) 312-622-9606
Chicago	312-726-8263	ABBS	Gamemaster					
Chicago	312-729-9374	?						PW=100,100
Chicago	312-729-9375	?						PW=ALPHA
Chicago	312-767-0202 U	CMMS				*24		
Chicago	312-782-8180	Forum-80	Mike Britton					
Chicago	312-782-9751	Comm-80				E&W		
Chicago	312-925-0259	Forum-80						
Oak Brook	312-941-9009	ABBS	Oak Brook Computer					
Downers Grove	312-964-7768	ABBS	Jeff Thorson			E&W		
Chicago	312-973-2227	ABBS	Hy Alexander			Days		
Rockford	815-229-2360	CBBS	Jim Mills,WB9KFP	824 Jordon Pl.		*24		
Joliet	815-727-7069						110	

Indiana

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Bloomington	812-334-2522	U	AM-100	Tho. Hogan			Wknds		Alpha-Micro users

Iowa

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address amd	Zip	Hours	Baud Rates	Notes
Iowa City	319-353-6528		ABBS	Apple-Med (C.Eicher)			E&W		
Dubuque	319-557-9618		ABBS	Jerry Kemp					
Des Moines	515-279-8863		ABBS	Computer Emporium					

Louisiana

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Shreeveport	318-631-7107		Forum-80						
New Orleans	504-454-6688		ABBS						

Kansas

City	Phon No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Wichita	316-746-2078		Forum-80				*24		
Kansas City	913-362-6398		ABBS						
Leavenworth	913-651-3744		Forum-80	Educational-80					
Olathe	913-764-1520		Forum-80	Engineer-80					
Kansas City	913-782-5115		Forum-80	Avionics-80					

Kentucky

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Louisville	502-245-8288						E&W		
Louisville	502-896-9624		ABBS						

Maryland

City	Phone No.	St.	Type		Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Baltimore	301-337-8825	U	CBBS		Prodigy Systems			*24	300	
Greenbelt	301-344-9156	U	CBBS	@	NASA (GAS)			*24	110,300	Robert Pincus
Baltimore	301-465-3176	U	ABBS		Logical Choice			E&W		
Silver Spring	301-593-7033	U	HEX		AMRAD, Dick Barth,W3HWN	11523 Chariton Dr.	20902	*24	110,300	Also, Deaf TTY
Randallstown	301-655-0393	U	RCPM		Balt. Micro-Mail, Rod Hart	9841 Branchleigh	21133	Till Mid.	110-600	Ring Back Home No.
Columbia	301-730-0922	U	ABBS		Computer Crossroads			E&W		
Gaithersburg	301-840-8588	U	PSBBS		The Unknown Sysop...			*24		
Silver Spring	301-593-3042	D	NBBS		WB3ETS					
Silver Spring	301-585-7172	B			Fine & Assoc.					
Parkville	301-661-8962	B			Muse Co.	7112 Darlington Dr.	21234			(V) 301-661-8547
Parkville	301-661-8963	B			Muse Co.	7112 Darlington Dr.	21234			(V) 301-661-8547
Rockville	301-983-9317				Washington Apple Pi	Box 34511,Wash.DC	20034			(V) 301-229-3458

Massachussetts

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Boston	617-354-4682		ABBS				E&W		
Amesbury	617-388-5125	U	RCPM	Howard Moulton			*24	300	Ring Back
Boston	617-431-1699		Forum-80	Wellesley College					
Dunstable	617-649-7097	B	Forum-80						
Westford	617-692-3973	U	Forum-80	Small Bus.Systems			*24		
Cambridge	617-864-3819	D	CBBS	Dave Mitton					
Maynard	617-897-0346	D	CBBS	N.E.C.S.					
Boston	617-963-8310		CBBS	New England Computer Soc.	Box 198,Bedford	01730	*24		(V) 617-593-3154

Michigan

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Detroit	313-288-0335	U	CBBS	Computer Mart			*24		
Pontiac	313-335-8456		Forum-80						
Westland	313-326-6050			S.E.Michigan Comp.Club	Box 02426,Detroit	48202		300	PW=HEL-Z301,SEMCO
Wayne	313-326-6000			SEMCO	Box 02426,Detroit	48202		110,300	PW=HEL-Z301,SEMCO
Grosse Pointe	313-343-2370			SEMCO	Box 02426,Detroit	48202		300	PW=HEL-Z301,SEMCO
Battle Creek	616-968-0001			SEMCO	Box 02426,Detroit	48202		300	PW=HEL-Z301,SEMCO
Lansing	517-676-1350			SEMCO	Box 02426,Detroit	48202		300	PW=HEL-Z301,SEMCO
Macomb Cty.	313-286-8820			SEMCO	Box 02426,Detroit	48202		300	PW=HEL-R901,SEMCO
Southfield	313-357-1422	U	ABBS	Mich.Apple-Fone			*24		Curt Deegan
Mt.Clemens	313-465-9531		Forum-80	Medical-80			E&W		
Detroit	313-477-4471		ABBS	Computer Connection					
Ypsilanti	313-484-0732		PBBS#1	Fred Hambrecht			*24		
Detroit	313-569-2063	B	ABBS	new # is 357-1422					
Royal Oak	313-588-7054	U	RCPM	Keith Petersom	1418 Genesee Ave.	48073	*24	110-600+	(V) 313-588-0184
Detroit	313-846-6127		CBBS	Technical CBBS, Dave Hardy			*24	110-600+	

Minnesota

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Minneapolis	612-561-6311		ABBS				*24		
Minneapolis	612-929=8966		ABBS						
Minneapolis	612-929-6699		PMS				*24		

Missouri

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Columbia	314-445-6502		ABBS	Brian Waterman					
St.Louis	314-838-7784	D	ABBS	Compunews			*24		
Florissant	314-839-4307		SLAMS						
Springfield	417-862-7852		ABBS				*24		
Kansas City	816-523-9131	B	Download						
Kansas City	816-531-1050		ABBS	Computer-Video Room					
Kansas City	816-737-1031	B							
Kansas City	816-861-7040	U	Forum-80#1	Bill Abney	7600 E.48th Ter.	64129	*24		(V) 816-921-9439
Kansas City	816-931-3135	B	Forum-80	changed to 931-9316					
Kansas City	816-931-9316	B	Forum-80	Comodities					

Nevada

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Reno	702-826-7234			Amos Byte Shop John Waycott			*24		Type "FREE"
Las Vegas	702-873-9491		Forum-80				E&W		
Las Vegas	702-873-9112			may be old number					

New Jersey

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Iselin	201-283-2724	U	RCPM	Bruce Ratoff			E&W	110,300	Ring Back
Patterson	201-345-0998		ABBS						
Bound Brook	201-457-0893	U	S.J.Mail	PSWD= "HEL-1999,MAIL"					
Monmouth Cnty	201-528-6623		Forum-80						
Union	201-688-7117	U	Forum-80	Ken Roser, WA2VCI	1907 Arbor La.	07083			(V) 201-688-3546
Scotch Plains	201-753-1225	U	ABBS	Steve Toth,ACGNJ UCTI	1776 Raritan Rd.	07076	E&W		(V) 201-277-2063
	201-753-8152		ABBS	ACGNJ	1776 Raritan Rd.	07076	E&W		
Haledom	201-790-6795		Msg-80	Photography					
Pompton Plains	201-835-7228	U	ABBS	Computer corner of N.J.	439 Rt.23	07444	E&W		(V) 201-835-7080
Saddlebrook	201-843-4563		ABBS						
Princeton	201-874-6833		Forum-80	Bill Taylor					
Wyckoff	201-891-7441		ABBS	Ralph's ABBS					
Piscataway	201-968-1074	U	ABBS	ACGNJ UCTI 1776 Raritan	Rd. Scotch Plains	07076	E&W		
Marlton	609-983-5970	U	ABBS	Jonathans Apple, Bill	1 Brick Rd.	08053	E&W		(V) 609-983-0668
Livingston	201-992-4847		Msg-80	Communique-80					

New York

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Manhattan	212-245-4363		Msg-80	Modem Over Manhattan					
Long Island	212-348-9685	N	TBBS	Art Altschul					
Long Island	212-448-6576	B	ABBS						
N.Y.City	212-787-5520		AABB	Amateur Astronomy			*24		Pierre Schwobe
N.Y.City	212-997-2186	N	ABBS	McGraw Hill					Office # ?
Long Island	516-334-3134		Forum-80	Programs Unlimited					Richard Taylor
Long Island	516-588-5836		Conn-80	BT Enterprises					Tom Vande-Stouwe
Long Island	516-698-8619		CBBS	Tim Nicholas			*24	300,1200	Ring Back
Bethpage	516-938-9043	U	CBBS	Long Island Comp.Society	3788 Windsor Dr.	11714	*24		(V) 516-731-1649
Endicott	607-754-5571		N*BBS	Bob Iannucci	6C Jane Lucy Dr.	13760	E&W		(V) 607-754-3517
Johnson City	607-797-6416	U	RCPM	Eds Communications Svc			E&W	300	
Bearsville	914-679-6559		SJBBS	Hank Sryszka			Eve	110-600+	

Ohio

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Cleveland	216-486-4176		Forum-80				E&W		
Akron	216-644-1965		ABBS	AKCOM			*24		
Barberton	216-745-7855	U	ABBS	Akron Digital Group	107 7th St.NW	44203	*24		Lou- 745-7819
Bowling Grn	419-352-4477		ABBS						
Toledo	419-531-3845		ABBS	Computer Store					
Toledo	419-865-1594		ABBS	ABACUS II					
Dayton	513-223-3672		ABBS						
Cincinnati	513-671-2753	U	ABBS	Computer Store			E&W		(V) 874-2283
Cincinnatt	513-752-9963		BBS-80						
Columbus	614-268-2227		CBBS						
Columbus	614-272-2759	U	CBBS	Ben Miller,WB8LGH	703 French Dr.	43228			(V) 614-279-0230
	614-649-7097	B							

Oklahoma

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Lawton	405-353-2554		ABBS						
Oklahoma City	405-528-8009	B	ABBS	OKC					
Tulsa	918-224-5347		Forum-80				Eve.		

Oregon

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Beaverton	503-646-5510	U	CBBS	Jim Willing,Bill Marx			*24	110-600+	(V) 503-288-9695

Pennsylvania

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Zip
Philadelphia	215-628-3134		ABBS						
Pittsburg	412-822-7176		CBBS	Wayne Gregor			*24		

South Carolina

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Columbia	803-771-0922		NBBS	Compusystems					

Tennessee

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Nashville	615-254-9193		ACS	Mike Portugal			*24		
Memphis	901-276-8196	U	Forum-80	Arnie Graber			*24		
Memphis	901-362-2222	U	Forum-80	Hobbyist			E&W		
Memphis	901-761-4743		ABBS	Computer Lab	627 S.Mendenhall	38117	E&W		

Texas

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Dallas	214-288-4859		Forum-80						
Dallas	214-634-2668	U	ABBS	KA Computer Store	1200 Majesty Dr.	75247	*24		(V) 214-634-7870
Dallas	214-641-8759		CBBS						
San Antonio	512-657-0779	U	ABBS	Modular S'ware,Bill Hyde	Box 12883	73212			(V) 512-657-3210
San Antonio	512-737-0214		ABBS						
Freeport	713-233-7943	U	PMS	Gulfcoast			*24		
Houston	713-654-0759	U	ABBS	HAUG			Eve.		
College Stat.	713-693-8080		ABBS	Youngs Elec.Svc.			E&W		
Houston	713-977-7019		ABBS				E&W		
Amarillo	806-355-5610		ABBS	Computer Corner	1800 S.Georgia	79109			(V) 806-353-5618
Waco	817-776-1325		ABBS						
Wichita Falls	817-855-3916	U	Forum-80	Texahoma Comp.Enth.	Jerry Janson		*24		(V) 817-855-1426
Ft.Worth	817-923-0009	B	Forum-80						
Sweetwater?	915-584-5393								

City	Phone No.	St.	Type
Provo	801-375-7000	B	download
Salt Lake Cty	801-466-1737	B	ABBS
Logan	801-753-6800	U	ABBS

City	Phone No.	St.	Type
St.Johnsbury	802-748-9089	B	
Essex Jnctn.	802-879-4981		ABBS

City	Phone No.	St.	Type
Vienna	703-255-2192	U	ABBS#1
Reston	703-620-4990	U	S.A.BBS
Falls Church	703-734-1387	U	CBBS
Vienna	703-281-2125	D	
Vienna	703-281-2222	D	HEX
Falls Church	703-379-0303	U	PMMI
Alexandria	703-765-2161	U	6800
Mclean	703-893-9474	D	ABBS
Fairfax	703-978-7561	U	Forum-80
Virginia Bch	804-340-5246		NBBS

City	Phone No.	St.	Type
Renton	206-244-5438		ABBS
Seattle	206-246-8983		XBBS
Everett	206-334-7394	U	Forum-80
Elma	206-482-5134		ABBS
Elma	206-482-5590		EBBS
Renton	206-524-0203		ABBS
	206-526-6239	B	
Seattle	206-546-6239	U	ABBS
Tacoma	206-723-3282	U	Forum-80
Tacoma	206-937-0444		ABBS

City	Phone No.	St.	Type
Milwaukee	414-282-8118	U	PBBS
Milwaukee	414-241-5406	U	RCPM
Hartland	414-241-8364	U	CBBS
Milwaukee?	414-727-3637		
Milwaukee	414-774-2683	U	RCPM

Utah

Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Discovery Software					(V) 801-753-6530
Frontier Computing	666 N.Main,Box402	84321			

Vermont

Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
			*24		

Virginia

Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Micro Soft.Systems			E&W		Craig Vaughan
TCUG					
AMRAD, Terry Fox, WB4JFI	1819 Anderson Rd.	22043	*24	110-600+	
Old No.-no longer available					
Old No.-no longer available					
Modem Test,Don Brown Suite	604,5201 Leesburg	22041	*24	110-600+	(V) 703-379-9660
Virginia TTY,Sid Balcom	Box 4034	22303	*24	Deaf TTY	(V) 703-765-6319
Paul Rinaldo, W4RI	1524 Springvale	22101			(V) 703-356-8918
Family Historians	5102 Pommeroy Dr.	22032	E&W	110,300	Geneology
Home Comp.Center			*24		

Washington

Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
APPLE-Crate II, APPLE Comp.	304 Main Av.S,#300	98055			(V) 206-271-4514
			E&W		
N.Wash.Info Exch.			E&W		
Apple-Crate I, APPLE Comp.	304 Main Av.S,#300	98055			(V) 206-271-4514
Bad Number for Al Jenson					
Al Jenson WA7TIB	19111 1st. Ave.NW	98177			
MicroPeripheral Corp.	Box 524,Mercer Isl.	98040			(V) 206-232-4505
Apple-Bin					

Wisconsin

Sponsor, or Name of Sysop	Address and	Zip	Hours	Baud Rates	Notes
Petted Micro Systems			*24	110-600+	
Calamity Cliffs			*24		
Milwaukee Area Digital Exch.			E&W		
			Day&Eve	110,300	
Rick Martinek					

Canada

British Columbia

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and Zip	Hours	Baud Rates	Notes
Burnaby	604-224-2337			Microstat Computer Store				
Burnaby	604-420-1006		CBBS	Dennis Breckenridge				
Vancouver	604-687-2640	U	CBBS	Steve Vinokuroff		*24	110,300	

Nova Scotia

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and Zip	Hours	Baud Rates	Notes
Nova Scotia	902-794-8198		CBBS					

Ontario

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and Zip	Hours	Baud Rates	Notes
Ottawa	603-236-3009			Francois Roy				
Ottawa	613-725-2243		CBBS	Marcel Cadieux				

England

City	Phone No.	St.	Type	Sponsor, or Name of Sysop	Address and Zip	Hours	Baud Rates	Notes
Hull	011-44-482-859169		Forum-80					

List of abbreviations used:
B= Number has been found to be bad.
N= No answer when called.
E&W= Evening and weekend hours.
D= System was down during test.
U= System has been tried and found to be up.

L P M '81

Roanoke Division League Planning Meeting

Formerly League Officials (LO) Meeting.

SPONSORED BY: Gay E. Milius, Jr., W4UG - Director
John Kanode, N4MM - Vice Director

PRODUCED BY: **NOVARC**, The Northern Virginia Amateur Radio Council
Stuart Meyer, W2GHK - President

L P M '81 is an excellent opportunity for you (and your club) to play an active role in planning the future activities of your ARRL through its Director, Vice Director and other League Officials.

* * * * EVERYONE IS WELCOME * * * *

For Further Details, Write to
N O V A R C
P.O. Box 682
McLean, VA 22101

STARTS SATURDAY, MAY 9 (1:00 p.m.) and CONCLUDES SUNDAY, MAY 10 (1:00 p.m.)

RAMADA INN
Tyson's Corner, Northern Virginia

AMRAD — Amateur Radio Research and Development Corporation

Membership Application/Renewal

Mail to: Gerald Adkins, Treasurer
1206 Livingston St N
Arlington, VA 22205

See reverse for overseas mailing rates.

Dues:	Annual	Life
Regular	$12	$120
2nd in family	6	60
Full-time student	3	-

Please make checks payable to AMRAD.

Name_____
Ham Call_____ Home Phone( )_____

Address_____
City,
State_____ ZIP_____

Class License_____ ☐ ARRL Member
Have: ☐ 2-meter FM ☐ RTTY
☐ Computer model_____
Microprocessor type_____

I agree to support the purposes of the Corporation.

*Signature*_____

THE AMATEUR RADIO RESEARCH AND DEVELOPMENT CORPORATION is a technically oriented club of about 300 radio and computer amateurs. It is incorporated in the Commonwealth of Virginia and is recognized by the Internal Revenue Service as a tax-exempt scientific and educational organization.

THE PURPOSES OF THE CLUB are to: develop skills and knowledge in radio and electronic technology; advocate design of experimental equipment and techniques; promote basic and applied research; organize forums and technical symposiums; collect and disseminate technical information; and, provide experimental repeaters.

MEETINGS ARE ON 1st MONDAY of each month at 7:30 p.m. at the Patrick Henry Branch Library, 101 Maple Ave E, Vienna, VA. If the 1st Monday is a holiday, an alternate date will be announced in the *AMRAD Newsletter*. Except for the annual meeting in December, meetings are normally reserved for technical talks - not business.

THE WD4IWG/R REPEATER is an open repeater for data communications (including RTTY), voice and experimental modes. It is located at Tyson's Corner, McLean, VA and has excellent coverage. It features a semi-private autopatch available to licensed members. Frequencies are: 147.81 MHz input, 147.21 MHz output. The head of the technical committee is Jeff Brennan, WB4WLW, 7817 Bristow Dr, Annandale, VA 22003, phone 703-354-8541.

THE AMRAD NEWSLETTER is mailed monthly to all members and to other clubs on an exchange basis. Technical articles, new product announcements, news items, calls for papers and other copy related to amateur radio and computing are welcome. Honorariums at a rate of $10 per printed page ($20 maximum per author per issue) are paid for original material accepted. Classified ads are free to members. Commercial ad inquiries are invited. The editor reserves the right to reject or edit any portions of the copy. Items should be mailed by the 8th of the preceeding month to Paul L. Rinaldo, W4RI, Editor, 1524 Springvale Ave, McLean, VA 22101; phone 703-356-8918. Full permission for reprinting or quoting items appearing in the *AMRAD Newsletter* is granted provided that credit is given. Mailing is by 3rd Class bulk mail to U.S. addresses and 1st Class to Canada and Mexico. Overseas readers add 96¢ for surface or $7.80 for air mail to annual dues.

THE AMRAD MESSAGE SYSTEM is an S-100 Computerized Bulletin Board System on 703-734-1387, system operator Terry Fox, WB4JFI. Terry's home phone number is 703-356-8334. The system accepts 110, 300, 450 and 600 baud ASCII callers using Bell 103-compatible modems.

THE HANDICAPPED EDUCATION EXCHANGE (HEX) is operated by AMRAD for those involved in education and communications for the handicapped. It accepts both 110/300-baud ASCII and deaf TTY callers. on 301-593-7033. The sysop Dick Barth, W3HWN's home phone is 301-681-7372.

AMRAD OFFICERS for 1981 are:

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Jeffrey Brennan, WB4WLW	Director
	Repeater Trustee
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	VP-Asia
Kenneth Coghill, WB4ZOH	1st Alt.
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	Vice Pres.
	Computer Trustee
William Pala, Jr., WB4NFB	Director
	Secretary
Paul L. Rinaldo, W4RI	Director
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